

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1-12. (canceled)

13. (previously presented) A method of regenerating a catalyst comprising:
providing a reactor vessel having a first section with a first width, wherein an outwardly tapered transition portion is coupled to the first section to so increase the first width, and wherein the tapered transition portion is coupled to a second section having a second width, wherein the first section has a diameter that is less than a diameter of the second section;
feeding a carbon-contaminated catalyst and an oxygen-containing gas at a predetermined flow rate to the first section to co-currently regenerate substantially all of the catalyst in the first section;
wherein the first section is configured to provide a residence time of the oxygen-containing gas effective to selectively produce carbon monoxide from the carbon-contaminated catalyst such that a ratio of the carbon monoxide from the carbon-contaminated catalyst to carbon dioxide produced from the carbon monoxide is at least 9:1; and
wherein the second section is configured to provide a second residence time of the oxygen-containing gas and carbon monoxide effective to produce carbon dioxide from the carbon monoxide.
14. (Original) The method of claim 13 wherein the first section has a first height H1 and a first diameter D1, wherein the second section has a second height H2 and a second diameter D2, and wherein D2:D1 is at least 2.5 and H2:H1 is at least 0.6.
15. (Original) The method of claim 13 further comprising operating the first section at a temperature of less than 700 °F and operating the second section at a temperature of less than 1100 °F.

16. (Original) The method of claim 13 wherein the second residence time of the oxygen-containing gas and carbon monoxide in the second section is sufficient to precipitate substantially all of the carbon-contaminated catalyst carried over from the first section.
17. (Original) The method of claim 13 further comprising feeding a second oxygen-containing gas comprising molecular oxygen to the second section.
18. (Original) The method of claim 13 wherein the oxygen-containing gas of the first section comprises an amount of molecular oxygen that is substantially equal or less than an amount required to convert substantially all of the carbon of the carbon-contaminated catalyst to carbon monoxide in the first section.
19. (Original) The method of claim 13 further comprising continuously providing the first section with carbon-contaminated catalyst.
20. (Original) The method of claim 13 further comprising coupling a catalyst to the second section that converts residual carbon monoxide to carbon dioxide.